Enhancing the Sensitivity of Hexagonal Plate Neutrino Detectors Using Evenly Spaced Rubidium Doping Combined with Multi-Layered Graphene Where Graphene Is Used to Allow Passage of Ultra- Weak LASER Light into the Spaces Between Rubidium Atoms

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Introduction

Despite the impressive sensitivity of rubidium (at ultra-cold temperatures) for radio wave detection and other applications, in the realm of neutrino detection, there is room for improvement. One such area in which improvement is possible lies in the fact that the valence electrons of rubidium atoms have varying spin orientations prior to a wave detection event. Maximal sensitivity can be attained by taking active measures to ensure that a “north over south” polar spin (facing outward from the flat plate of the detector) is ensured in all of the rubidium atoms, rather than simply allowing spin orientation to flux randomly between detection events.

Abstract

Since neutrinos tend to flux into electrons from nearby photons and free electrons and since the direction of the flux tends to predictably alter the spin orientation of the valence electrons of rubidium, it stands to reason that if one could “reset” the spin orientation so that it is uniformly “north over south” i.e. if the discrete magnetic field plane projected outward from the plate in each and every rubidium atom would necessarily be an active participant in detection, rather than the roughly 50% that are otherwise useful. This is the case because signal detection depends upon the “torquing” of electron spin from a north-over-south orientation to an east-west orientation (parallel with the platter.) If a spin orientation happens to be east-west at the time of a neutrino wave intersecting the detector, the spin orientation would remain unchanged, rendering that particular electron useless for detection purposes.

One might use the metaphor of the booby-trap known as a trip wire to better explain this concept. A trip wire is linear and is not useful if the potential victim is walking parallel with the wire. It is partially useful if the victim is walking at a diagonal angle relative to the wire. If we think of each rubidium atom’s valence electron as a trip wire, by ensuring that each electron has a uniform north-over-south spin orientation prior to detection, we are doing the equivalent of ensuring that a series of trip wires covering a wide section of battlefield are always perpendicular relative to the path along which an enemy soldier is walking. Just as trip wires are only useful when perpendicular to the path of an enemy soldier, rubidium’s valence electrons are only useful for neutrino detection so long as the field plane of their own internal magnetism is parallel with neutrino sources.

Method

This end may be achieved by the counterintuitive measure of shining an ultra-weak LASER light onto the detector whilst shielding the detector using a calibrated multi-layer graphene shield. The graphene would be oriented relative to the rubidium atoms (which would be predictably spaced) so that the carbon atoms (light-absorbing) would sit directly above the rubidium and the hexagonal voids found naturally in graphene (the spaces between the six atoms in each hexagon) would permit the passage of light toward the areas between the rubidium while ensuring that none of the light directly interacts with the rubidium in such a way that would generate interference. As the light passes to the sides of the valence electrons of the rubidium, the neutrino flux would alter the spin orientation with each pulse of the light so as to "reset" the spin orientation to a north-over-south orientation.

Caveat

Since the gold of which these detectors are traditionally composed would convey interference from the light into the system at large, in addition to using beryllium as the basis of the larger metallic hexagons, the non-conductive beryllium could also be deposited over top of the gold/rubidium layer in those areas in which light is designed to bombard (at low intensity) the platter. Such a detector, rather than being composed of simply gold over beryllium, would, in addition, feature areas in which some additional beryllium is actually layered atop the gold to prevent the energy from the light from polluting the signal received. A patchwork of nanoscopic beryllium plates would cover all areas of the gold except for the immediate area around rubidium atoms. Artfully, nanoscopic hexagons of beryllium would sit upon macroscopic hexagons of gold, which would sit upon the macroscopic hexagons of beryllium.

Conclusion

Although this design would increase the cost of production for the detector units, the already astronomical cost of cooling these units dwarfs any additional expense imposed by this proposal. Using light to reset the spin orientation of the valence electrons of rubidium may even open up the possibility of being able to operate the detectors at higher temperatures than currently required.